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TITLE: AIR CONDITIONING DEVICE
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ABSTRACT:

PURPOSE: To prevent the generation of odor through dry of an evaporator without exhausting odor in a room, by a method wherein, when detected humidity of air exceeds a given value, air is fed to the evaporator side, a supply opening is closed, and an exhaust port is opened.

CONSTITUTION: When an evaporator 19 is dried after completion of normal operation, with an ignition switch turned OFF, a humidity sensor 31 is actuated. When humidity is increased to higher than a given value, an amplifier 33 starts an actuator 35, and a motor 11 starts a blower fan 9. As a result, when air sucked through either intake ports 13 or 15 is fed in cases 3a and 5a, a damper 25 is actuated by the actuator 35 through a link mechanism 37, an exhaust port 21 is opened, and a communicating part 23 is closed. Thus, after air fed in the case 5a flows through an evaporator 19 to dry the evaporator 19, the air is exhausted through the exhaust port 21 to the outside.

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Industrial Application] This invention relates to the air conditioner for cars which can prevent especially the nasty smell which blows off from this air conditioner for cars, and an offensive odor in detail about the air conditioner for cars.

[0002]

[Description of the Prior Art] When starting the air conditioner for cars conventionally, the nasty smell which was piling up in the ventilation path of an air conditioner blows off, and the fault of giving crew displeasure is posing a big problem recently. Then, the cure of emitting air including a nasty smell in [in order to solve this trouble, until various examination is made, for example, it detects the thing as which the purge door of emitting outside a vehicle the blow-off air in which a nasty smell is included at the time of starting of an air conditioner is independently prepared, or JP,62-143712,A regards and for which the door was opened like at the time of entrainment of crew and it puts an air conditioner into operation] several seconds, and outside a vehicle is worked on. However, in the former, there was a fault that a predetermined wind was not given to crew, at the time of nasty smell emission, and sufficient deodorization had the problem of operating only when there is a fault that it cannot do and also a door is opened, by the latter from the time of entrainment before starting of an air conditioner again.

[0003]

[Problem(s) to be Solved by the Invention] The purpose of this invention improves the fault of the above-mentioned conventional technique, and offers the air conditioner for cars which it can prevent that the offensive odor at the time of starting of the air conditioner for cars and a nasty smell blow off to the vehicle interior of a room by the easy configuration.

[0004]

[Means for Solving the Problem] This invention adopts a technical configuration which was indicated below in order to attain the above-mentioned purpose. Namely, Blois for sending a wind all over ventilation passage, the heat exchanger which carries out heat exchange of the ventilation air, In the air conditioner for cars with which the fluid blow-off hole for blowing off the air by which heat exchange was carried out to the vehicle interior of a room is prepared It is the air conditioner for cars with which the fluid inhalation hole for inhaling the fluid discharge hole for discharging ventilation air outside ventilation passage and the air outside ventilation passage in a path is prepared between the Blois concerned and the fluid blow-off hole concerned.

[0005]

[Function] Since the air conditioner for cars concerning this invention has adopted a technical configuration which was described above, it adds to the fundamental configuration member in the well-known air conditioner for cars conventionally. At the time of the usual actuation of this air conditioner for cars While closing some or all of the fluid discharge hole prepared between Blois 3 concerned and the fluid blow-off hole 6 concerned, and a fluid inhalation hole, when putting the air conditioner for cars concerning this invention into operation Since it is operated so that the fresh air outside this ventilation passage may be introduced in this ventilation passage while the fluid containing the nasty smell which the fluid discharge hole concerned and a fluid inhalation hole are opened wide, and piles up in this ventilation passage 2, and an offensive odor is discharged by vehicle outdoor The nasty smell or

offensive odor blown into the vehicle interior of a room at the time of starting of this air conditioner for cars is made to emit to vehicle outdoor, and the open air fresh in the meantime is supplied to the predetermined period vehicle interior of a room.

[0006]

[Example] Below, the example of the air conditioner for cars concerning this invention is explained at a detail, referring to a drawing. Drawing 1 is the outline sectional view showing one example of the air conditioner 1 for cars concerning this invention. All over drawing and the ventilation passage 2, Blois 3, an evaporator 4, the heater core 5 For example, it sets to a foot (FOOT) 61, a vent (VENT) 62, or the air conditioner 1 for cars with which the fluid blow-off hole 6 grade which the various blowdown holes of defroster (DEF) 63 grade consist of is prepared. The air conditioner for cars with which the fluid discharge hole 7 and the fluid inhalation hole 8 are formed between Blois 3 concerned and the fluid blow-off hole 6 concerned is shown.

[0007] Namely, it sets to the air conditioner for cars concerning this invention. In order to cancel the trouble in the above-mentioned conventional air conditioner for cars, at the time of starting of the air conditioner for cars concerned or [not making the nasty smell and offensive odor which are piling up in the ventilation passage 2 of the air conditioner for cars concerned blow off to the vehicle interior of a room / which constitutes like] -- or The property of human being's sense of smell to the starting nasty smell is taken into consideration, and like, the nasty smell and offensive odor which are piling up in the ventilation passage concerned in two constitute in the appearance which does not give displeasure to the crew who does not burst into laughter to the vehicle interior of a room at a stretch, and who is present in the vehicle interior of a room, as the air in this ventilation passage is made to blow off to the vehicle interior of a room gradually.

[0008] If it is in the air conditioner for cars concerning this invention for the reason To the fundamental configuration member in the well-known air conditioner for cars, conventionally In addition, the fluid 7 containing the nasty smell which newly piles up in this ventilation passage 2 between Blois 3 concerned and the fluid blow-off hole 6 concerned, and an offensive odor, i.e., the fluid discharge hole which discharges air to vehicle outdoor, While the fluid containing the nasty smell which this fluid discharge hole 7 is opened wide, and piles up in this ventilation passage 2, and an offensive odor is discharged by vehicle outdoor, the fresh air outside this ventilation passage is introduced in outside ventilation passage, and the fluid inhalation hole 8 for making this vehicle interior of a room blow off is formed.

[0009] In this invention, this fluid discharge hole 7 is good to prepare near the evaporator in which this nasty smell and an offensive odor tend to pile up preferably. Moreover, in the air conditioner for cars concerning this invention, dampers 9 and 10 are arranged at the fluid discharge hole 7 concerned and the fluid inhalation hole 8, respectively. The 1st damper 9 arranged at the fluid discharge hole 7 concerned is constituted so that it can close alternatively any of the fluid discharge hole 7 and the ventilation passage 2 concerned concerned they are, and there is, and its thing to which the opening is adjusted by the proper control means 13 and which is constituted like is [this 1st damper] desirable.

[0010] That is, in the air conditioner for cars concerning this invention, this 1st damper 9 may close the whole surface of the fluid discharge hole 7 concerned, there may be, by adjusting opening, is what closed a part of aperture of the fluid discharge hole 7 concerned, and there may be. The 2nd damper 10 arranged on the other hand at the fluid inhalation hole 8 concerned is constituted so that the aperture of the fluid inhalation hole concerned can be closed alternatively, and there is, and its thing to which the opening is adjusted by the proper control means 14 and which is constituted like is [this 2nd damper] desirable.

[0011] That is, in the air conditioner for cars concerning this invention, this 2nd damper 10 may close the whole surface of this fluid inhalation hole 8, there may be, by adjusting opening, is what closed a part of aperture of the fluid inhalation hole 8 concerned, and there may be. [as well as this 1st damper] Furthermore, as for the 1st and the 2nd damper 9 and 10 concerned, in this air conditioner for cars concerning this invention, it is desirable that it is the thing by which each opening is controlled under commutative relevance based on the data-processing result of the operation control means 12 which controls each control means 13 and 14 and which is constituted like.

[0012] Namely, it sets to the air conditioner for cars concerning this invention. The 1st and the 2nd damper 9 and 10 take into consideration extent of an offensive odor and a nasty smell, the reinforcement

of Blois, the property of human being's sense of smell, etc. other than binary control of full closing and full disconnection. this -- The opening of each of the damper may differ mutually and there may be, and each may be constituted again so that it may change individually or in time.

[0013] As shown in drawing 1, the control means 13 and 14 which control these each dampers 9 and 10 answer a command from a central data-processing means (CPU) 12 to perform data processing according to a predetermined program, and carry out adjustment control of the opening of each damper concerned. Opening is adjusted to each of each of these dampers 9 and 10 by for example, the link type servo motor (not shown).

[0014] Therefore, in this 1st damper 9, in one revolution edge, this damper 9 is a location which closes this ventilation passage 2 completely, and this damper 9 can take [in / this damper 9 is a location which closes the aperture of this fluid discharge hole 7 completely, and / the other-end section] the revolution include angle of the arbitration between both these revolution edges. On the other hand, in this 2nd damper 10, the revolution include angles of arbitration including the condition of closing the aperture of this fluid inhalation hole 8 completely can be taken.

[0015] Furthermore, in the air conditioner for cars concerning this invention, it is desirable, and that the inhalation means 11 for open-air suction for taking in a fresh air from the outside of this ventilation passage 2 in a predetermined amount and this ventilation passage 2 to this fluid inhalation hole 8, and making it blow in into this vehicle interior of a room through this fluid blow-off hole 6 is established consists of fans who drive by the proper motor, and this inhalation means 11 for open-air suction may have it.

[0016] Blois 3 and this open air suction means 11 which were described above in this air conditioner for cars in this invention -- the result of an operation of said central data-processing means (CPU) 12 carried out -- being based -- respectively -- coincidence -- or it is controlled according to an individual and is. Below, the actuation and the control approach of the air conditioner for cars concerning this invention are explained. If the 1st damper opens this fluid discharge hole 7 so that clearly from drawing 1, the fluid which flows the inside of this ventilation passage through an evaporator 4 from Blois 3 will be emitted outside this fluid discharge hole 7 empty vehicle.

[0017] Moreover, when this 1st damper 9 closes the aperture of this fluid discharge hole 7 completely, an inflow fluid flows the inside of this ventilation passage 2 in the usual condition. On the other hand, if the 2nd damper 10 is opened wide, preferably, through this inhalation means 11 for open air suction, a fresh air will be inhaled from the outside of a vehicle, and it will be introduced into the vehicle interior of a room. That is, in using the air conditioner for cars concerning this invention for usual, it has set this 1st damper 9 in the condition that closed the aperture of this fluid discharge hole 7 completely, and the damper 10 of ***** 2 closed the aperture of this fluid inhalation hole 8 completely.

[0018] here, when putting this air conditioner 1 for cars into operation now, the 1st mode takes the location where this 1st damper 9 closes this ventilation passage 2 completely, and sets it as the condition that this fluid discharge hole 7 was opened wide completely -- having -- on the other hand -- this 2nd damper 10 -- predetermined opening -- with, the aperture of this fluid inhalation hole 8 is opened in the predetermined condition. In the starting mode, the fluid containing the nasty smell which was piling up in this ventilation passage 2, and an offensive odor is discharged outside this fluid discharge hole 7 empty vehicle, and, on the other hand, the air outside a vehicle is supplied to the vehicle interior of a room through this inhalation means 11 for open air suction from this fluid inhalation hole 8.

[0019] And if predetermined time amount passes, it will be made to return to the original condition and the usual air-conditioning processing will be performed. other voice in the air conditioner for cars applied to this invention on the other hand -- like -- setting -- this -- control which carries out adjustment control and relates the 1st and the 2nd damper 9 and 10 to proper opening is performed according to the above-mentioned program determined by taking into consideration human being's sense-of-smell property like.

[0020] In this mode, the fluid which this fluid discharge hole 7 was wide opened immediately after starting of this air conditioner for cars and between the initial time amount a of starting, and was attracted from this Blois is first discharged outside this fluid discharge hole 7 empty vehicle with the fluid containing the nasty smell to which the 1st damper 9 is piling up near [evaporator 4] this, and an offensive odor as the example of an operating condition is shown in drawing 2. Moreover, this 2nd

damper 10 also carries out specified quantity disconnection of the aperture of this fluid inhalation hole, and the fluid outside this ventilation passage (air) is supplied to the vehicle interior of a room from this fluid inhalation hole 8.

[0021] then -- if the opening of both dampers changes gradually and 60 seconds pass since the time of a certain fixed time amount T2, for example, starting, after this initial time amount T1 of starting passes -- this -- the 1st and the 2nd damper 9 and 10 will close this fluid discharge hole 7 and this fluid inhalation hole 8, respectively, and the usual air-conditioning actuation will be performed. Therefore, according to this mode, the open air is inhaled, the open air is supplied to the vehicle interior of a room, and the displeasure at the time of starting can be canceled at the stage immediately after starting of this air conditioner for cars when a nasty smell is sensed most by [whose a nasty smell decreases] being alike, therefore making it return to the usual operating state.

[0022] Even if the operating instructions of the air conditioner for cars concerning starting this invention utilize human being's olfactory adaptation and a nasty smell component disperses in the vehicle interior of a room, the amount can attain early effectiveness by making it change gradually in the condition that human being is not sensed. Are as being shown in drawing 3, if attached to the effectiveness acquired by the air conditioner for cars concerning this invention, and it sets to the conventional air conditioner for cars. Although, as for the reinforcement of an odor, it turns out that advanced level is held and the concentration is also in a very high condition even if most time amount passes, after putting this air conditioner for cars into operation as shown in drawing 3 (A) and (B) In the air conditioner for cars concerning this invention, as shown in drawing 3 (C) and (D), the reinforcement of an odor is falling sharply rather than it can set the level from the time of starting of this air conditioner for cars to the conventional air conditioner for cars, and it turns out that the level is falling quickly according to the passage of time.

[0023] Moreover, a tale requires that the effectiveness by using the air conditioner for cars which has also reduced the concentration by half compared with the conventional thing, and it requires for this invention is remarkable. in addition -- although it is what always operates in the air conditioner for cars in the above-mentioned example when this air conditioner starts -- as another example -- under a halt -- the odor in this air conditioner for cars -- for example, also when it acts as the monitor by the stinking sensor and this odor concentration turns into predetermined upper limit concentration, constitute so that it may operate automatically is also possible.

[0024] Furthermore, in the air conditioner for cars concerning this invention, it is possible to change closing motion-control time amount whenever [closing motion / of the damper concerned] according to extent of the concentration of the nasty smell of the fluid which is piling up in the ventilation passage 2 concerned, and an offensive odor. That is, when the concentration of the nasty smell concerned and an offensive odor is low, review time can be set as less than [60 seconds or it] whenever [puncturing / of for example each of this damper], and when the concentration of the nasty smell concerned and an offensive odor is high, review time can be conversely set up more than 180 seconds or it whenever [puncturing / of for example each of this damper].

[0025] Moreover, in this invention, even if it is not the concentration of an actual nasty smell and an offensive odor, when the relation between the temperature of a fluid, humidity, etc. and the conditions which this nasty smell and an offensive odor tend to generate and the conditions which are easy to pile up is defined beforehand, this temperature or humidity is detected and the result is in agreement with these conditions, it is the thing it was made to operate the air conditioner for cars of this invention, and you may be. Furthermore, in this invention, according to the ventilation mode of Blois, it asks for the relation of the airflow property and damper opening which blow off to the vehicle interior of a room through the ventilation passage concerned beforehand preferably, and the result is stored in the storage means of CPU which is a data-processing means.

[0026] As for the subfan as an inhalation means 11 for open air suction, in this invention, it is possible to also make it contribute to ventilation of the vehicle interior of a room and reduction of a thermal load by interlocking with [stage / to open this fluid inhalation hole 8] the 2nd damper 10 formed in this fluid inhalation hole 8, starting actuation, and operating this subfan 11 at the time of parking. In the use at the time of starting parking, a power source different from the main dc-battery, for example, a solar battery etc., can be used for the drive power source of the subfan 11 concerned.

[0027] Moreover, in this invention, the airflow which blows off from this Blois, and the airflow inhaled by this subfan 11 are controlled so that the total amount becomes as fixed as possible. It is required for performing gradually the adjustment change of whenever [in ***** 1 and the 2nd damper / puncturing] to apply for at least 60 seconds preferably, and to perform gradually. In this invention, although the fluid containing the nasty smell which is piling up in this ventilation passage 2 by actuation of this air conditioner for cars, and an offensive odor is discharged from this fluid discharge hole 7, if any wind is not supplied to the vehicle interior of a room in the meantime, crew will appeal against displeasure, but in this invention, since this subfan 11 operates, the starting problem is solvable.

[0028] When starting, especially in summer, air in the car serves as an elevated temperature, and it becomes the elevated temperature of the air which blows off from this air conditioner for cars, but since the temperature of the air supplied to the vehicle interior of a room by the air conditioner for cars in this invention is OAT extent as it is high, giving especially crew displeasure is avoided. Below, the actuation procedure of the air conditioner for cars concerning this invention is explained according to the flow chart of drawing 4.

[0029] In step 1, initial setting is performed after a start. what sets up discharge mode in this initial setting -- it is -- concrete -- the 1st damper 9 -- this ventilation passage 2 -- a closing location -- and this fluid discharge hole 7 is set as an open position, and the damper 10 of **** 2 is set as an open position. Next, in step 2, when it is judged whether the drive switch of the air conditioner for cars concerned was pushed and this air conditioner for cars does not serve as ON, it returns to step 1.

[0030] If there is this air conditioner for cars by ON at step 2, a counter starts, Blois 3 will serve as ON at step 3, and the inhalation means 11 for open air suction will become coincidence with ON in step 4 at coincidence. The fluid which the starting actuation was answered, and the evaporator operated and was piling up in this ventilation passage 2 is discharged by this fluid discharge hole 7 empty-vehicle outdoor, and on the other hand, when the subfan as an inhalation means 11 for open air suction of the outside fluid inhalation hole 8 operates, the open air is inhaled in the outside ventilation passage 2, and is supplied to the vehicle interior of a room through the fluid blow-off hole 6.

[0031] In step 5, a counter clocks elapsed time X and it judges whether it went through the time amount by which this 2nd damper is fully opened from the time of the full open period a of this 2nd damper with which the elapsed time X from the time of this air conditioner for cars serving as ON was defined beforehand, i.e., this air conditioner for cars, serving as ON. The full open periods a of this 2nd damper are T1 of drawing 2, and a corresponding period, are periods when initial airflow is fixed, for example, they are set up so that it may be called 10 seconds.

[0032] And at step 5, when this elapsed time X has not yet gone through this predetermined time amount a, return and the above-mentioned step are repeated to step 3. the case where this elapsed time X goes through this predetermined time amount a at the *** step 5 -- step 6 -- progressing -- the elapsed time X concerned -- this -- it judges whether review time b passed whenever [closing motion / of each 1st and 2nd damper].

[0033] Whenever [closing motion / of each of this damper], about this 1st damper 9, review time b shall be a period which makes small gradually whenever [puncturing / of this fluid discharge hole 7], and enlarges whenever [puncturing / of this ventilation passage 2] gradually conversely, and shall express the function of whenever [puncturing] with alpha (X) as it was described above. About the damper 10 of ***** 2, it shall be the period which makes small whenever [puncturing / of this fluid inhalation hole 8], and carries out it gradually, and the function of whenever [puncturing] shall be expressed with beta (X).

[0034] Furthermore, in this invention, whenever [closing motion / of this damper], review time b is time amount measured from the actuation initiation point in time of this air conditioner for cars, for example, is set up like 60 seconds. And in step 6, when this elapsed time X has not gone through this predetermined time amount b, it progresses to step 7, and it is set as alpha (X-a) whenever [puncturing / of the 1st damper 9], it is set as beta (X-a) whenever [puncturing / of the damper 10 of **** 2], and the closing motion include angle of each damper is adjusted.

[0035] and -- while only 1 carries out the increment of the counter value over this elapsed time X and the process of return and these steps 6 and 7 is repeated to step 6 -- this -- it adjusts, changing the opening of the 1st and the 2nd damper 9 and 10. In step 6, when this elapsed time X goes through this

predetermined time amount b, it progresses to step 8, and it is set as alpha (b-a) whenever [puncturing / of the 1st damper 9], it is set as beta (b-a) whenever [puncturing / of the damper 10 of **** 2], and the closing motion include angle of each damper is adjusted.

[0036] That is, when starting, this fluid discharge hole 7 will be closed this 1st damper 9 completely, and this fluid inhalation hole 8 will be closed the damper 10 of ***** 2 completely. Subsequently, it progresses to step 9, and a drive of this subfan 11 is stopped and the usual air-conditioning operation mode is performed in step 10.

[0037] It is judged at step 11 whether the drive switch of the air conditioner for cars is OFF, and if it is ON, if it is return and OFF, it will become step 10 with END.

[0038]

[Effect of the Invention] In the air conditioner for cars concerning this invention, since the above configurations are adopted, the air conditioner for cars which can prevent that the offensive odor at the time of starting of the air conditioner for cars and a nasty smell blow off to the vehicle interior of a room is offered.

[Translation done.]

Nissan / Nippon
Radiati.

図は制御手段の電気回路図、第3図は従来例の全体構成図、第4図は温度及び臭気強度の関係を示す表図、第5図は臭気、温度及び相対湿度の関係を示す表図である。

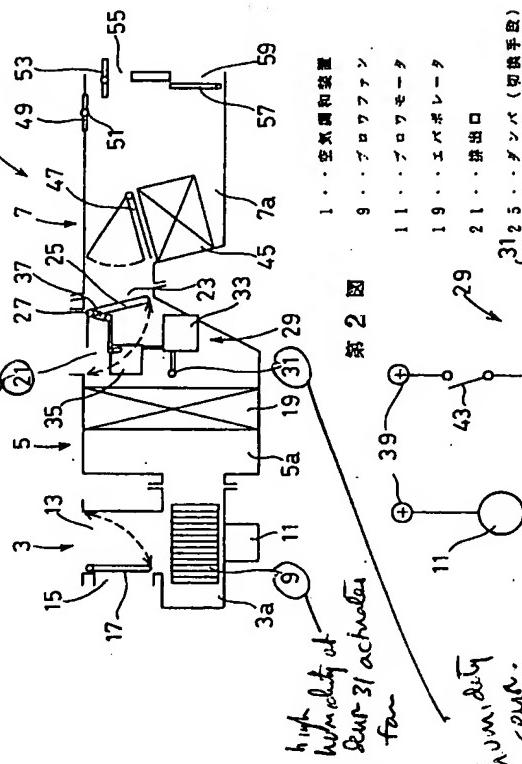
- 1 · · 空気調和装置
- 9 · · ブロワファン
- 11 · · ブロワモータ
- 19 · · エバボレータ
- 21 · · 排出口
- 25 · · ダンバ (切換手段)
- 29 · · 制御手段
- 31 · · 温度センサ
- 33 · · アンプ
- 35 · · モータアクチュエーター
- 51、55、59 · · 吹出口

特許出願人 日産自動車株式会社
特許出願人 日本ラディエーター株式会社
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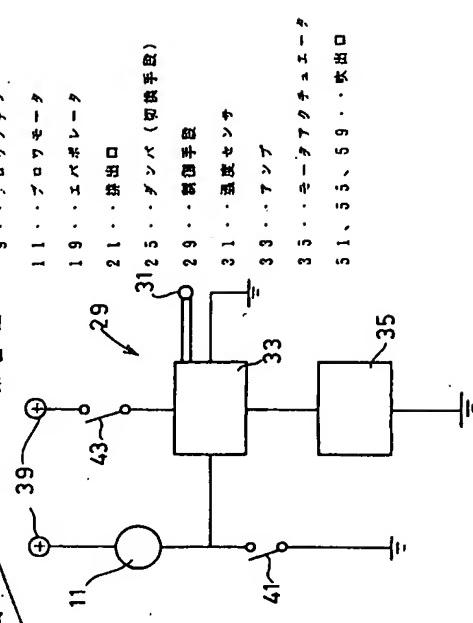


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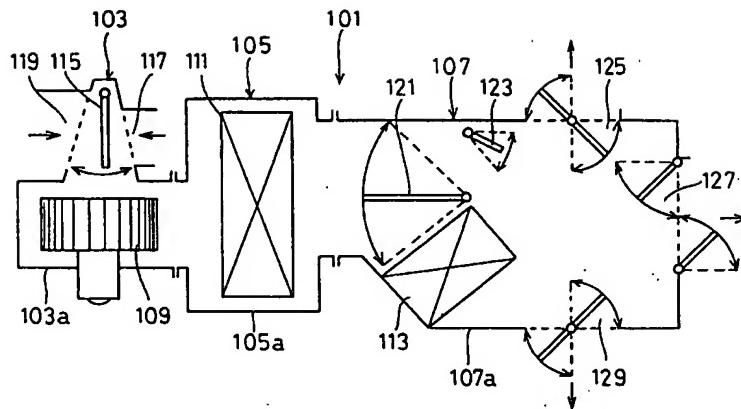
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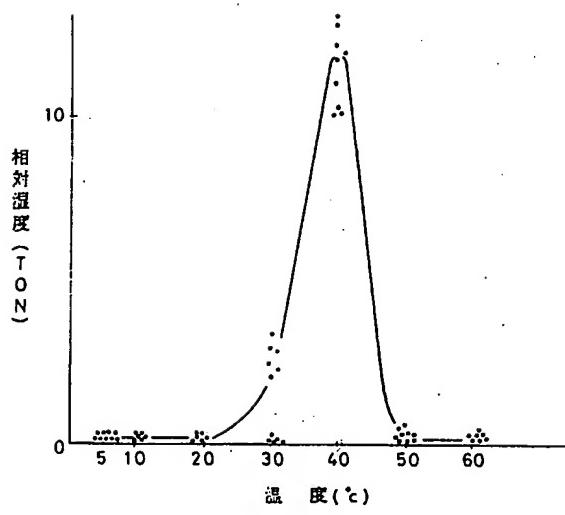
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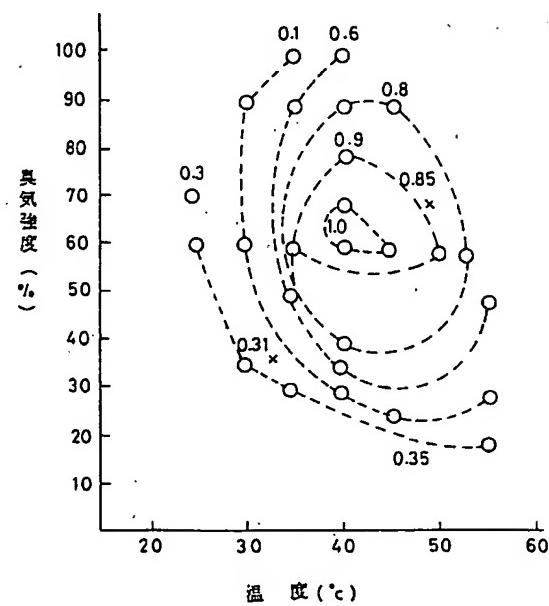
第3図



第4図



第5図



⑫ 公開特許公報 (A) 昭62-152918

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B 60 H 3/00識別記号
A-7219-3L

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審査請求 未請求 発明の数 1 (全6頁)

③発明の名称 空気調和装置

②特 願 昭60-291895
②出 願 昭60(1985)12月26日

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明細書

1. 発明の名称

空気調和装置

2. 特許請求の範囲

プロワファンの起動によりエバボレータ側に送風し吹出口を介して室内側に吹出す空気調和装置において、上記エバボレータの下流に外部へ開口した排出口を設け、切換手段により吹出口側への送風を排出口に切換可能とともに、エバボレータより吹き出した空気の温気を検出してプロワファン及び切換手段を制御する制御手段を設けたことを特徴とする空気調和装置。

3. 発明の詳細な説明

(産業上の利用分野)

この発明はプロワファンとエバボレータとを備えた空気調和装置に関する。

(従来技術)

この種従来の空気調和装置の一般的なものとしては、例えば、第3図に示すものがある(日産自動車株式会社昭和60年8月発行「サービス周報

J第535号E-30頁参照)。すなわち、このものは車両用の空気調和装置101であるが、プロワユニット103、クーラユニット105、ヒータユニット107が連続されて構成されている。各ユニット103、105、107のケース103a、105a、107a内にはそれぞれプロワファン109、エバボレータ111、ヒータコア113が配設されている。そして、駆動状態の一例として、例えば、夏場の冷房や梅雨時の除湿等の際にエバボレータ111を運転させる際には、インテークドア115によって閉閉が切換られた外気側吸入口117と室内側吸入口119とのいずれから導入された空気は、まず、プロワファン109によりクーラユニット105に送り込まれ、エバボレータ111で除湿(又は除湿冷却)されて、さらにヒータユニット107へ送り込まれる。ヒータユニット107に送り込まれた空気はエアミックスドア121、123の閉閉調整によりヒータコア113に入る空気と入らない空気の量が調節される。そして、この空気がデフ吹出

口 125、ベント吹出口 127、足元吹出口 129 等から各所に吹出されることとなる。

ところで、エバボレータ 111 には運転の際に空気中の水分が凝縮して結露することとなるが、空気中には水分の他に有機物やアスペルギルス属、ペニシリウム属、トルコジルマ属、リゾップス属等の真菌類等が浮遊しているため、これら有機物や真菌類等もエバボレータ 111 に付着することとなる。そして、真菌類は高温と湿気を好み、しかも有機物を介して増殖していくので、通常運転停止後にもこの湿気のあるままでエバボレータ 111 を放置しておくと、特に夏場等温度の高い季節には時間が経つにつれて悪臭を発するようになる。第4図及び第5図（財団法人悪臭公害研究会 1980年発行「悪臭と官能試験」参照）はこの臭気、温度及び湿度の関係を示している。まず、第4図は湿度が 100%（一定）の場合に温度変化による臭気強度（Threshold odor number）の変化を示すものであり、この表から、40℃の付近で最も臭気強度が高いことが判る。また、第5図

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るために徒らに長い間運転させておくと駆動源であるバッテリーの容量が不足する事態となる等の問題点がある。しかも、プロワファン 109 は通常一方向に送風するように設計されており、この乾燥運転時にも空気は室内側に送風されることとなるので、乾燥に伴い蒸発した水分、剥落した有機物、真菌類等を含んだ空気が車室内に送り込まれ折角空気調和された室内が汚染される上に、乾燥運転時の騒音が室内に入る込む等の問題点があった。

この発明は上記問題点に鑑み、空気調和装置運転終了後室内が汚染されることなくエバボレータを乾燥できるようにしたことを目的としたものである。

〔問題を解決するための手段〕

この発明は上記目的を達成するために、プロワファンの起動によりエバボレータ側に送風し吹出口を介して室内側に吹出す空気調和装置において、上記エバボレータの下流に外部へ開口した排出口を設け、切換手段により吹出口側への送風を排出

は湿度及び温度の変化による臭気分布で、1.0 が最も悪臭を感じやすいことを示すものであり、この表から、湿度 60%、温度 40℃の付近でもっとも臭気を感じることがわかる。そして、このような悪臭が再度の運転時に車室内に引き込まれることとなる。したがって、これを回避するためには通常運転停止後にエバボレータ 111 を乾燥させるか、または、温度を低下させるか、または乾燥及び温度を低下させておく必要がある。そして、上記従来例のものでも、解決策の一つとして通常運転停止後にプロワファン 109 は起動させて、プロワファン 109 からの送風によりエバボレータ 111 を乾燥させることにより、臭気の発生を防止することはできる。

〔発明が解決しようとする問題点〕

ところが、この方法ではどのくらいの時間プロワファン 109 を起動させておいたら十分に乾燥するか判断がつかず、そのため中途半端な乾燥になり再度の運転に際して悪臭が室内に入り込むおそれがあるばかりでなく、反対に十分な乾燥を得

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口に切換可能とともに、エバボレータより吹き出した空気の湿気を検出してプロワファン及び切換手段を制御する制御手段を設けて構成した。

〔作用〕

この発明は、通常運転時においてはプロワファンの起動によりエバボレータ側から吹出口側に向けて送風される。また、通常運転停止後には制御手段がエバボレータより吹き出した空気の湿度を検出しこれによりプロワファン及び切換手段とが起動され、プロアファンがエバボレータ側に送風するとともに、切換手段により吹出口が閉じられる一方で排出口が開かれる。そして、プロワファンによる送風はエバボレータを通じて乾燥させ、乾燥に伴う水分、有機物、真菌類等を含んだ空気は排出口から外部に排出される。エバボレータが乾燥されると、これを検出した制御手段の制御によりプロワファンの起動が停止されるとともに、切換手段により排出口が閉じられる一方で吹出口側への送風が可能な状態となる。したがって、エバボレータは乾燥し、真菌類の付着、増殖

が妨げられるので、エバボレータより悪臭が発生することが防止される。

(実施例)

この発明の構成を車両用の空気調和装置について第1図乃至第3図に示す一実施例に基づいて説明する。

空気調和装置1はプロワユニット3、クーラユニット5及びヒータユニット7から構成されている。

プロワユニット3のプロワケース3a内には面方向から導入した空気を直徑方向に送風可能なプロワファン9が設けられている。プロワファン9はプロワモータ11に駆動される。プロワケース3aには外気を導入する外気側吸入口13、車室内の空気を導入する室内側吸入口15が形成されており、この両吸入口13、15の開閉はインテークドア17により切換えできるようになっている。

クーラユニット5のクーラケース5a内にはエバボレータ19が配設されており、このエバボレ

ータ19内の冷媒により送風される空気が除湿冷却されるようになっている。

21はクーラケース5aにエバボレータ19の下流側、即ち、エバボレータ19とヒータユニット7との間に位置して設けられ外部に通ずる排出口である。この排出口21とクーラケース5aとヒータケース7aとの連通部23とは切換え手段としてのダンパ25によって交互に開閉可能に形成されている。このダンパ25は、クーラケース5aに取付けられたヒンジピン27を回動支点として回動するようになっている。

29は上記エバボレータ19の近傍に設けられた上記プロワモータ11とダンパ25との制御手段である。この制御手段29はエバボレータ19より吹き出された空気の湿度を検出する湿度センサ31、湿度センサ31に接続されたアンプ33、アンプ33に接続されたモータアクチュエータ35とからなる。モータアクチュエータ35はリンク機構37を介して上記ダンパ25のヒンジピン27と連動している。第2図は制御手段29の電

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気回路図であり、プロワモータ11と、アンプ33及びアンプ33に接続されダンパ25の開閉を制御するモータアクチュエータ35とはバッテリー39に対して並列に接続されている。41はファンスイッチ、43はイグニッションスイッチである。そして、ファンスイッチ41とともにイグニッションスイッチ43が切られると、イグニッションスイッチ43の切り信号を受けたアンプ33からの信号で湿度センサ31が作動し、湿度センサ31で60%以上の湿度が検出された時にはアンプ33からの信号でプロワモータ11及びモータアクチュエータ35が駆動されるようになっている。一方、湿度が60%以下の時には湿度センサ31からの信号を受けたアンプ33からの信号でプロワモータ11及びモータアクチュエータ35が駆動されないようになっている。

ヒータユニット7のヒータケース7a内にはヒータコア45が設けられており、このヒータコア45は図示しないウォーターコックの開閉により温度調節されるとともに、エアミックスドア47

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の開閉により導入される空気の量が調節されるようになっている。ヒータケース7aにはデフドア49により開閉されデフロスターに吹出すデフ吹出口51と、ベントドア53により開閉されベンチレーターに吹出すベント吹出口55、フットドア57により開閉され足元に空気を送る足元吹出口59とが形成されている。

次に上記のように構成された上記一実施例の作用を説明する。

運転状態の一例として夏場あるいは梅雨時等の除湿又は除湿冷却等エバボレータ19を使用する場合を説明する。

通常運転時にはイグニッションスイッチ43及びファンスイッチ41を入れると、プロワモータ11が駆動されプロワファン9が起動され、外気側吸入口13または室内側吸入口15の開放されているいずれかから空気がプロワケース3a内に導入される。プロワケース3a内に導入された空気はプロワファン9の面方向から直徑方向に送風されて、クーラケース5a内に導入される。そし

て、送風された空気はエバボレータ19により除湿され、乾燥状態でさらに、エバボレータ19の下流側に送られる。この際、ダンバ25により排出口21は閉鎖され、連通部23は開通している状態にある。したがって、エバボレータ19で乾燥された空気はヒータケース7a内に送風される。ヒータケース7aに送られた乾燥した空気は適宜開放状態にあるデフ吹出口51、ベント吹出口55、足元吹出口59から所望の位置に吹出されることとなる。

ところで、エバボレータ19は導入された空気の除湿に伴い、その表面には空気中の水分が凝縮されて結露する他に、空気中の有機物、真菌類等が付着することとなる。

そこで、通常運転終了後にエバボレータ19を乾燥させるには、まず、イグニッションスイッチ43を切るとその切り信号がアンプ33に伝えられ、アンプ33からの信号により湿度センサ31が作動する。そして、湿度センサ31で検出したエバボレータ19より吹き出された空気の湿度が

60%以上になっていると、湿度センサー31から検出信号が伝えられたアンプ33がモータアクチュエータ35を起動するとともに、プロワモータ11を起動させる。そして、プロワモータ11に駆動されてプロワファン9が起動して、吸入口13、15のいずれかから吸入された空気はプロワケース3aを経由してクーラケース5a内に送風されるとともに、モータアクチュエータ33に起動されてリンク機構37を介してダンバ25が作動され、排出口21を開放し、連通部23を閉鎖する。クーラケース5a内に送風された空気はエバボレータ19を通過する際、エバボレータ19に結露した凝縮水を蒸発させて乾燥させる。この乾燥に伴い凝縮水が蒸発する他、有機物、真菌類等も剥落する。そして、この水分、有機物、真菌類等を含んだ空気が排出口21から外部に排出されることとなる。したがって、エバボレータ19が悪臭の発生源となることが防止されるとともに、エバボレータ19を通過した悪臭を含んだ空気が吹出口51、55、59から室内に吹出されるこ

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とが防止される。しかも、乾燥運転時のプロワファン9等の騒音が室内に導入されることが防止される。

また、エバボレータ19近傍の湿度が60%以下に下がった後はプロアファン9及びモータアクチュエータ35の起動が停止されるので、中途半端な乾燥で起動が停止されることがなく、しかも、徒に長い間プロアファン9及びモータアクチュエータ35の起動を行う必要がないのでバッテリー39の容量が足りなくなる事態も回避することができる。

特に、新車のときからこの乾燥運転を行うことにより、エバボレータ19に有機物や真菌類等の全く付着しない状態に保持することでき、悪臭の全くない状態で空気調和装置1の運転を行うことができる。

なお、上記実施例では制御手段はエバボレータ19近傍の空気の状態を検出するものとして湿度センサ31を有するものを示したが、これに限定されず、湿度センサを有するもの、あるいは湿度

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センサ31及び温度センサの双方を有するものでもよい。

〔発明の効果〕

以上の説明から明らかなように、この発明の構成によれば、プロワファンからの送風によりエバボレータに結露した凝縮水を蒸発させて乾燥するものでありながら、エバボレータの中途半端な乾燥となることを回避することができ再度の通常運転時に室内に悪臭が入る込むことを防止することができるとともにプロワファンを徒に長い時間駆動させる必要がなく駆動源であるバッテリーの容量が不足するような事態を回避でき、しかも、エバボレータを乾燥させて水分、有機物、真菌類等を含んだ空気は排出口より外部に排出され吹出口側には送風されないので、室内が汚染されたり、室内に乾燥運転に伴う騒音の導入を防止することができる。

4. 図面の簡単な説明

第1図及び第2図は本発明に関する空気調和装置の一実施例を示し、第1図は全体構成図、第2